In praise of the humble "Inverted V" dipole

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The last couple of weeks I've felt like I did when I first became licensed in 1985, spending many enjoyable hours in the backyard playing around with antennas. In those days there were quite a few antenna failures, but also one or two successes. All of it was a valuable learning experience. In recent years I've come to depend on simple wire antennas such as dipoles and verticals, and these have worked well subject to a couple of qualifications. I have a particular fondness for the quarter wave vertical, except for one thing ..... noise pickup!

The problem

Power line noise has been a very long-time annoyance at this QTH due to the presence of very old aerial power feeders in the area. Depending on the prevailing weather, the general level of power line noise ranges from moderate (the lowest) to very high. It is even audible on the VHF broadcast band where it interferes badly with strong signals. The local electrical utility, responding to my many complaints over the years, has changed insulators and such, but the problem has essentially remained unchanged.

The "inverted V" solution

Consequently, it has been a long term desire of mine to mitigate this noise problem as much as possible. Over the years I have found that some wire antennas do differ considerably in their power line noise pickup. Sadly, verticals are by far the worst in general terms. Dipoles are better (less noise pickup) and full wave loops also possess a low noise pickup characteristic. However, loops do present some constructional difficulties compared to simple dipoles. Listening to an "on-air" QSO a while back, where the subject of "inverted V" dipoles was being discussed, it occurred to me that I'd never tried an "inverted V" dipole on 20 m.

My 40 m antenna is a separate "inverted V" dipole which has performed extremely well long-term; I realised that it has never been overly bothered by power line noise. Thus encouraged, after first noting the level of power line noise received with my existing 20 m horizontal dipole, I hurriedly reconfigured the dipole into a classic "inverted V" dipole. I was stunned to note that the level of power line noise had dropped by an average 2 to 2½ "S" points. Listening around on the band showed no deterioration in the strength of signals being received; if anything, the opposite!

Feeding options

The time since that afternoon has seen much tweaking, involving feedline changes, baluns and even noise bridge measurements, which have been rather interesting. It is nice when the practical observations agree with theory! Certainly, the noise bridge measurements confirm that the feed-point impedance at resonance has indeed dropped to slightly less than 50 ohms and that the SWR bandwidth has narrowed somewhat, again in accordance with theory. I have even opted to feed the "inverted V" with coax via a 1:1 current mode balun at the feed-point, given that the feed impedance is so low.

Ordinarily I would prefer to feed antennas with high impedance balanced feeder; however, resorting to the antenna books showed that direct feeding with balanced feed line and using an ATU in the shack was not that efficient in terms of additional loss caused by SWR. Direct feeding with RG58 coax is actually somewhat more efficient. The use of the balun is also a worthwhile addition in the interests of achieving a properly balanced feed. Digressing onto the subject of baluns briefly, I find the simple current mode 1:1 balun excellent in this application, although I am also a fan of the voltage mode 4:1 balun. Baluns! Yes, it is a complex and involving subject, but it's nice to know that both types work well in practice.

Performance

The best thing about the "inverted V" dipole is its excellent performance. Apart from the excellent low noise receive profile, it radiates beautifully as well! My definite "gut feeling" is that my "inverted V" dipole is performing better than its earlier configuration as a horizontal dipole. Perhaps I shouldn't be surprised. I noticed the same order of improvement when my 40 m "inverted V" was changed from a horizontal dipole, something necessitated by the loss of one of the end supports in a storm.

I've had some fantastic contacts on the 20 m "inverted V" dipole of late, and I've been hearing European and American DX with much stronger signals than I did with the horizontal dipole. Why should this be? Is it the result of "mixed" signal polarisation, or is it due to the elevated high current feed-point? I don't really know. Whatever the reason, it works beautifully! This is definitely one antenna that is easy to put up, requiring only one high centre support. I highly recommend it as a basic but high performance antenna.

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